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Chief, St/I/R 17 May 1956
THRU : Chief, D/S

Chief, S/TR

Requirements on Repair Capacity of Railroad Roundhouses

Background

In connection with the revision of HIS-29, "Capacity of the Trans-Siberian Railroad and Connecting Lines", it has been discovered that the railroad roundhouses may have a capacity significantly less than the number of locomotives required to operate the line at full capacity. It is possible that the method being used to calculate roundhouse capacity is based on average performance, and not on maximum performance. The following requirement is being submitted as a problem, with the request that it be submitted to railroads operating in Northwestern United States, such as the Milwaukee Road, Great Northern, and Northern Pacific. It is requested that, if possible, at least preliminary answers be submitted by 29 May 1956.

This background statement is classified Secret. The requirements may be handled as unclassified if separated from the background statement.

Requirement

It is requested that the following assumptions and problems be submitted to individuals who have had extensive experience in the operation of locomotive roundhouses and backshops, particularly during World War II when many roundhouses were under pressure to perform at their peak.

A. Assumptions:

1. That a maximum amount of traffic must be moved over a railroad line during a period of two years and probably longer.

2. That the line has the following characteristics:

a. Double track

b. In good condition

c. Frequent 1% grades

d. Steam operated

e. It is a 400-mile-long section and is part of a longer line

3. That average temperatures are similar to those in western Canada: January average, -8°F; July average, 60°F. Winter snowfall is moderate.

4. That as many locomotives are available as are necessary to move a maximum amount of traffic over the line.

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5. That unlimited trained manpower is available.

6. That the locomotive repair facilities have the following characteristics:

a. The 400-mile section has a total of 104 locomotive stalls in roundhouses and backshops.

b. Sufficient equipment and spare parts are available, consistent with the number of locomotive stalls.

c. Roundhouses and backshops perform the following: running repairs; boiler washing and related repairs; and medium, or intermediate, repairs.

d. Capital repairs are performed at locomotive factories and hence do not tie up backshop space.

7. Locomotive boiler water is soft, or is properly treated to reduce hardness.

B. Problems

1. What percentage of the output from these roundhouses and back shops would have to consist of each of the major classes of repair (running repair, boiler wash, and medium repairs, but excluding capital repairs which will be performed elsewhere), to keep the locomotives operating efficiently?

2. What is the lowest average time possible to perform each of the major classes of repair (running repair, boiler wash, medium repairs), consistent with keeping the locomotives operating efficiently?

3. Given the 104 locomotive stalls in roundhouses and backshops and the percentage distribution given in B-1 above, what is the maximum number of locomotives which could be put out daily by these 104 stalls over a period of two years or longer? Give this figure for the following:

a. Daily average for an entire year.

b. Daily average in summer.

c. Daily average in winter.

4. What percentage of the locomotives on this 400-mile section of line would be found in the 104 locomotive stalls at any one time, on the average? To calculate this percentage, it should be assumed that all locomotives are either in for repairs or operating; no account should be taken of reserve locomotives.

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5. Assuming that locomotives are performing as close to their capacity as possible, and that the water is either soft or has been properly treated, how frequently would boiler washing be required? It is requested that source give an assumed average daily locomotive run under the assumption that maximum locomotive performance is being asked for, consistent with keeping the locomotives in good operating condition.

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